Mann, W. W.

1872.

A NEW

DECIMAL METRICAL SYSTEM

FOUNDED ON THE

EARTH'S POLAR DIAMETER,

AND DESIGNED FOR ADOPTION BY ALL CIVILIZED NATIONS,

AS THE

ONE COMMON SYSTEM.

BY

William

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LANGE, LITTLE & HILLMAN,
PRINTERS, ELECTROTYPERS AND STEREOTYPERS,
108 to 114 WOOSTER ST., N. Y.

A NEW METRICAL DECIMAL SYSTEM,

DERIVED FROM

THE EARTH'S POLAR DIAMETER.

PREFATORY.

THE pamphlet describing a new decimal system of measures, weights, and money, entitled "The Linn-base System," by the writer of the pamphlet now in hand, was only a short time in print when its author became aware that the labor, and it was considerable, which he had expended on it, was, to a great extent, lost. He believed, and yet believes, that his Linn-base System possesses, in far superior degree to the French "Metric System," requisite conditions for an international metrological system, and he hoped that it would supersede the latter in public favor, as competitor for the honor of general adoption.

But the writer has become fully convinced that neither his Linn-base System, nor the "Metric System," will ever gain the distinction coveted. There are several of the leading political and commercial powers of the world, notably England, Russia, and the United States of America, whose consent, while it must be had, cannot be gotten. These powers will never accept either system as the common system of nations. Is it asked, why? We answer, that many considerations conspire, inducing the powers to this determination, and firmly holding them there. Some of these considerations are reasonable and of real force; others, not so; yet none the less efficient, invincible, and controlling. We cite but one—the really strong, reasonable, and, of itself,

quite sufficient consideration. It is this: These leading nations, while desiring and seriously seeking a common metrological system, *would have the best that can be devised.* No considerations of seeming present expediency, however urgently pressed, will avail to induce acceptance of a system proven to be incompetent or fundamentally defective. Before incurring the grave inconveniences inseparable from metrological revolution in their large communities—counting population by hundreds of millions, and covering continents of area—they ask assurance that they have secured the best possible substitutes for the systems about to be discarded; so that, by and by, it will not become necessary for themselves or posterity to change again. *Tabulâ rasâ,* who believes that even the French would re-inscribe upon it their own system? What folly, then, to ask its acceptance from independent nations that have as yet made no change! Some of its serious defects are certainly remediable. Yet they attempt no improvement; they admit no imperfection; lest the nations be scared from the "Metric System." The nations must accept it, as it is, without change, purely and simply. Such would be, indeed, a very simple acceptance. What! shall not the world profit of the advance made in science, since the invention of that "Metric System" which has deservedly shed undying glory upon France, and upon the illustrious *savans* who invented it? As well might they have retained without improvement, and insist upon the world's so accepting, the little first steamboat in which, shortly after the establishment of the "Metric System" in France, they saw Fulton navigating the Seine. The "Metric System" was invented seventy-seven years ago. "But the world has moved" since 1795, as much perhaps as since 1821. Let those honored and illustrious *savans* accept—or France for them—the place in scientific metrology, that Fulton occupies in scientific steam navigation and—be content. That place, cordially and gratefully, the world assigns and history will ever ascribe to them.

It is certain, now, that our earth affords a standard far

superior to the quadrant of a meridian, from which to extract a scientific unit of lineal measure. This better standard is the earth's polar diameter, or its axis of revolution. It is known to-day that a better metrological system than the French "Metric System," and one upon a better basis, *may be had.* The conditions required are thus acquired; and the latter must abandon its claim to international adoption; and so, likewise, the Linn-base System. They both sin fundamentally, radically, and unpardonably—in their basis. From the effects of this original sin, there is no salvation for them. The perdition of both is sure.

Having settled in this conclusion the writer turned to the earth's polar axis, for a new unit of lineal measure, upon which to construct a new metrological decimal system. The result of his search and labor is given in the following pages.

Sir John Herschel's Proposition.

A distinguished English geodesist, Captain A. R. Clarke, has published in Vol. xxix. of the Memoirs of the Royal Astronomical Society an elaborate paper, in which a length of 41,707,536 feet or 500,490,432 imperial inches is assigned to the earth's polar axis. Of this memoir, and in special reference to this assigned length of the polar axis, Sir John Herschel, Oct. 11, 1863, writes, that it "*contains by far the most complete and comprehensive discussion which the subject of the earth's figure has yet received; and must be held as the ultimatum of what scientific calculation is as yet enabled to exhibit, as its true dimensions and form.*"

Treating the question of metrological unity, and the establishment upon geodetical basis of a new system, Sir John Herschel adverts to the very close approach made by the above cited extent in inches of the earth's polar diameter to the round number 500,500,000 imperial inches. And then, struck by the possibility, thus demonstrated, of finding in that round sum a unit of lineal measure almost exactly

equivalent to the imperial inch, he exclaims εὕρηκα, and suggests the adoption of this precise round number of inches as the length of the polar axis, and the proclamation of the inch, so defined, as a fundamental unit of length. And in support of the idea he goes on to say: "The change, so far as relates to any practical transaction, commercial, engineering, or architectural, would be absolutely unfelt; as there is no contract for work, even on the largest scale, and no question of ordinary mercantile profit or loss, in which one *per mille*, in measure or in coin, would create the smallest difficulty. Neither could it be doubted that our example would be very speedily followed both in America and Russia, so soon as the reason of the thing and the trifling amount of the change came to be understood."

Now, it strikes us that this is taking an unwarrantable liberty with that very respectable creation of science, the earth's polar axis; and that it is an unmathematical encroachment upon the domain of fiction. Five hundred million and five hundred thousand (500,500,000) imperial inches is not the length of the polar axis. We know it is not. And science should not, under any circumstances, assume or assert it to be. The length of the axis is some 10,000 inches short of that sum. It is writ, Sir John, "Nothing extenuate," as well as "set down naught in malice." We hold it to be the mission of science to discover *truth*, and make it known for the use of mankind; to declare the truth discovered, whatever it may be, wherever it may lead; whatever it knocks down, whatever it sets up. And it should tell nothing but the truth. It ill becomes mathematical science to make figures lie, despite the adage. Indeed, the dignity of science, and the maintenance of that high place in the world's consideration, upon which its influence and usefulness in great measure depend, require that the scientific standard-base which it may find for an international metrological system should be neither pared, nor spliced, nor bent to suit individual conveniences. Otherwise, the complaisance extended to one, will, of as good right, be demanded by others; and

the result will be no common system at all, or a very faulty, rickety, and inconsistent one, that true science would be ashamed to own, and the world, ere long, glad to shuffle off. If the inch defined, as Sir John Herschel suggests, should be made the unit of a new metrological system, there may be found some choleric individual, who will say to science—adopting an expression much stronger, to be sure, than polite, and which, notwithstanding its origin, may hardly become classic—"You lie! you villain, you lie!" And, assuredly, among the discomfited partisans of the "Metric System," in this country and elsewhere, there will be no lack of disappointed scientific "soreheads," shaking ireful, if not direful pens, and of sciolist civilians, brandishing their sharp pins, only too glad of the opportunity to echo and re-echo the reproach. Science, passionless and serene, truthful, impartial, severe, exact, should give to carpers no such opportunity.

Besides, there is something unpleasant and grating—aye, and something more serious than that too—in the idea that we would be laying in solemn form, and cementing *untruth* for the corner-stone of the edifice; that, from considerations of convenience and expediency, we would be deliberately putting falsehood, if not deception, at the foundation of the system; a system too—note here the sinister omen—of measures and weights, intended for general and permanent adoption; to be in the daily use of ourselves and of posterity. Is it wise to teach our children in their schools, as they would in such event be taught, when learning the new system, that it is permissible, if current convenience seem to require, to set truth and principle aside; gaining, without them, over them, in despite of them, the end desired?

Again, the measures of length, of capacity, and of weight established by the new system, are to be, in the service of commerce, daily used by merchants, wholesale and retail, the world over. Many of these doubtless will make themselves acquainted with the history of the system. Will it be well that they read in the first verses of the first chapter of the

Genesis which records its origin, that every yard-stick, gallon-measure, and pound-weight in their employ, is begotten of a false standard created for them by the best and wisest of the land? Is this consideration, think you, of a character to deter merchants from letting the original sin which old-fashioned Christians hold to be ever lurking in us, conspire with that which we know will impregnate their measures—to the considerable prejudice of customers? False measures and false measurers would be the natural progeny, by lineal descent, for all time to come, of a falsehood, deliberately established by law as the base of a metrological system.

Besides, it is not a good system, the most convenient for ourselves, or for any one particular nation, that we are seeking or willing to accept. We seek a system suitable for all, and the best that can be devised. Now, it is manifest that a new system would present itself for acceptance to the world under much more favorable conditions, if it appear that, in all cases, measures of individual nations conform to the standard chosen; that the standard chosen is made to bend for the convenience of none. It is surprising that the above considerations, militating against decimalization of the imperial inch as he suggests, did not present themselves to the fine, square, honest, and sagacious British mind of Sir John Herschel, and influence his argument.

The Polar Axis as a Basis.

Yet it is in the polar axis of the earth, in its axis of revolution, that this new decimal system of measures and weights has sought and found its unit base. The most able and zealous advocates of metrological uniformity, by general adoption of the French "Metric System," admit that their geodetical basis is not perfect, nor the best; that the terrestrial meridians are unequal, and that the *metre*, even if truly the ten-millionth part of one quadrant, is not the ten-millionth part of the quadrant of any other of the many meridians differently situated on the earth's surface.

They admit the polar axis of the earth, which is the common minor axis of all meridians, to be a magnitude entirely unique; and that, even if the earth were a true spheroid, there would be a higher degree of scientific fitness, there would be something upon which the mind could dwell with more entire satisfaction, if a fraction of that axis should be assumed as the basis of a metrological system, in preference to a fraction of any quadrant, or any other known magnitude. "Such," it is declared by one of the most witty, testy, and tireless (we had almost writ untiring) of the partisans of the "Metric System"—"Such was the view of Sir John Herschel, and"—mark here the interesting concession of this witty writer, on his own account—"*and, if the whole thing were to be done over again, it would probably be the unanimous opinion of the scientific world.* But"—the witty writer referred to adds—"But the matter has gone too far now to change the base." Not so, it is objected. If the gentleman should find, some morning, that he had, unfortunately, made considerable progress in getting on a pair of fundamentally defective, soiled, or torn summer pants, would he deem it too late to change the base, drawing off the offending vestment and laying it aside? Not so, it is objected again. Without specifying nations counted as already won to the "Metric System," but which have as yet only partially adopted it, we must remind the defenders of the "Metric System" that the empire of Russia, the empire of Austria, the empire of the United States of America, and the British empire, upon which "the sun never sets," have not yet accepted that system. And further, that these four empires count for considerable in the world, in the several matters of area, population, interior and exterior commerce, political power, moral influence, and physical weight, measured by their armies, navies, and annual material production. And further, that their garment don't fit these giant statures, and they will never wear it. And further, that no metrological system invented, or to be invented, though it were adopted by all the rest of the civilized world, may presume to have effected

metrological uniformity—nor to have half effected it—till Russia, Great Britain, and the United States of America shall have concurred in accepting the same. And further, finally, the system which these powers do accept will promptly become the one uniform, universal system of nations, no matter what the extent of progress averred by its friends to have been made, and to be making in that direction, to that end, by the "Metric System." It takes a great many mites to make a million.

THE NEW SYSTEM.

Applying, then, to this "unique magnitude," upon which the mind may dwell with entire satisfaction, the polar axis, for a geodetical basis, the conclusion was soon reached to establish the *one thousand million*th, ~~*nine hundred and eighty thousand, eight hundred and sixty fourth,* (1,000,980,864th)~~ part of double the earth's polar diameter, as the decimal unit of lineal measure, and base of this new decimal system of measures, weights, and money, now to be described. Eminent geometers, British and other, have shown what a close approximation the British imperial inch accidentally makes to our new decimal unit. Slightly greater, our unit is exactly 1.000980864 imperial inches. The number of inches (500,490,432) assigned by Captain Clarke in the memoir above cited, as the length of the polar axis, may not be exactly correct. Captain Clarke, himself, shortly after its publication, added a few inches as the result of subsequent calculation, with additional data. Very probably, as science advances, still greater accuracy may be attained, and other inches may be added to, or taken from the sum above specified. Very well; let them come. Very well; let them go. The correction of error, whether *plus* or *minus*, cannot possibly affect, practically, in any sensible degree, the measures and weights of a metrological system created now upon the geodetical basis selected for this system. As the corrections shall be made, let them be publicly announced, and the requisite amount be added to or taken from the as-

cribed length of the axis. What we know certainly, in advance, is, that the geodetical science of to-day has made so great progress, its ground is so firm, its data so ample and well-acquired, its processes so accurate and sure, that material, or even considerable error is impossible.

Unable to invent another and better series of numerals for this new system than was used in the Linn-base; or a more appropriate and complete nomenclature, and general plan, than were employed there; the author has availed himself of his right as proprietor to demolish th...

ERRATA.

In five instances (viz: on pages 10, 11, 13, 16, and in the "Synoptical View," page 34) the decimal unit of Lineal Measure has been erroneously defined. It should, in all cases, be read: *The one thousand millionth* (1,000,000,000th) *part of double the earth's polar diameter.*

NOTE (for page 16).

Under this system, the usual itinerary measure would be the *pentalinn* (1.58 miles). Albany is 90 pentalinn distant from New York. New York is 142 pentalinn (or more exactly 142 pentalinn and 40 trialinn) N. E. of Washington.

The unit of lineal measures for commerce, would be the *dualinn* (8¼ feet). Bales, pieces, and packages of dry goods, and of all articles of merchandize sold by the yard, would be marked as containing so many dualinn. The practical yard-stick upon counters, would be of 50 Linn (the half-dualinn) divided into linn and henalinn. In retail trade, buyers would ask for 5, 20, 50, 75, 90, or 100 Linn; or for 125, 240, or 370 Linn; or for 1, 3, 5, 10, or 20 dualinn of an article, as they might require. Thus, the dualinn and linn, the duacapp (1¼ quarts) and the capp, the duapondd (3 6-10 lbs. av. d. p.), and the pondd—that is to say, the three commercial units in measures of length, of capacity, and of weight—would all agree, and conveniently combine with the divisions of money (the monn and binimonn) in which prices are stated and paid.

DESCRIPTION OF THE SYSTEM.

This New Decimal System of Measures, Weights, and Money, derives its base-unit from the *Earth's Polar Axis.*

Its unit of lineal measure and base, the LINN, is

The one thousand million th ~~nine hundred and eighty thousand, eight hundred and sixty-fourth (1,000,080,864th)~~ part of double the earth's polar diameter.

NOMENCLATURE.—The nomenclature of the system has been invented with special regard to conditions of acceptability by all nations. The fitness and utility that would make names, throughout the system, indicate the nature of the thing named, were also borne in mind. The units are called—

Linn (Lat. *linea*, a line), unit of lineal measure, or of length.

Arr (Lat. *area*, surface, area), unit of square measure, or of area.

Soll (Lat. *solidus*, solid), unit of solid measure, or of volume.

Capp (Lat. *capacitas*, capacity), unit of liquid and dry measure, or of capacity.

Pondd (Lat. *pondo*, weight), unit of gravity, or of weights.

Monn (Lat. *moneta*, money, coin), unit of money.

Gradd (Lat. *gradus*, a step), unit of circular measure.

Tempp (Lat. *tempus*, time), unit of time measure.

Degg (Lat. *de*, *gradus*, degree), for thermometers.

The unmistakeable cosmopolitan character of these names seems to fit them for general adoption. Neither by form nor origin do they point to any particular modern country. They can neither gratify nor wound the *amour propre* of any existing people. They are short, being all monosyllabic, and of easy utterance, beginning and ending with different letters, so that there can be no possible confusion among them of sound. Throughout all the denominations they are invariable, having no plural termination. We say 1 linn, 25 linn—1 pondd, 85 pondd. Moreover, these names, to the ear and to the mind, by sound, as by origin, are instantly suggestive of the thing signified. *Linn* suggests lineal measure. Arr suggests measures of area. Soll suggests solids; capp, capacity; pondd, weights; and monn, money. It should be especially noted, also, that in all the languages of Europe, very nearly the same pronunciation must be popularly given to these names of the units. By

the accepted rules of pronunciation, the sound of the words, when uttered, cannot materially vary, wherever the letters of our language are used. But the final consonants must remain double, or grave variations of pronunciation will ensue.

Value of the Units.

LINN, the 1000,~~000,001~~ 000,000th part of double the earth's polar axis....................................	1 Linn.
ARR, an area, or surface of..........................	1 square Linn
SOLL, a volume, or bulk of..........................	1 cubic Linn.
CAPP, a vessel of which the capacity is of............	1 cubic Linn.
PONDD, the weight of one CAPP-ful of distilled water..	1 cubic Linn.
MONN, a silver coin, equal to the United States' *dollar*.	
GRADD, the 1000th part of the circle..................	

The multiples and divisions or fractions of the units.

All the multiples and fractions of the several units are *decimal;* and the denominations are formed by prefixing to the names of the units Greek numerals, from one to ten, to designate the multiples, and Latin numerals, from one to six, to designate the fractions. The numerals are—

DECA (Gr. δέκα, ten)	tenth	multiple...............	10,000,000,000
ENNA (Gr. ἐννέα, nine)	ninth	"	1000,000,000
OCTA (Gr. ὄκτω, eight)	eighth	"	100,000,000
HEPTA (Gr ἑπτά, seven)	seventh	"	10,000,000
HEXA (Gr. ἕξ, six)	sixth	"	1000,000
PENTA (Gr. πέντε, five)	fifth	"	100,000
TETRA (Gr. τέτρα, four)	fourth	"	10,000
TRIA (Gr. τρια, three)	third	"	1000
DUA (Gr. δύο, two)	second	"	100
HENA (Gr. ἕνα, one)	first	"	10
Unit..			1
PRIMI (Lat. *primi*, first)	first	division...............	$\frac{1}{10}$
BINI (Lat. *bini*, two)	second	"	$\frac{1}{100}$
TERNI (Lat. *terni*, three)	third	"	$\frac{1}{1000}$
QUARTI (Lat. *quarti*, four)	fourth	"	$\frac{1}{10000}$
QUINI (Lat. *quini*, five)	fifth	"	$\frac{1}{100000}$
SENI (Lat. *seni*, six)	sixth	"	$\frac{1}{1000000}$

In this system, the numerals employed do not—as in the

French "Metric System"—indicate the products resulting from multiplication of the units, nor the fractions resulting from their division; but they indicate the number and order of the several multiplications and divisions. To illustrate; *myria*, in the "Metric System," expresses the multiple 10,000. In this system, *tetra*, the equivalent of *myria*, indicates the fourth decimal multiplication of the unit, producing, as is seen in the above table, the same multiple, 10,000. In the descending series, or divisions of the units, *milli*, of the "Metric System," expresses the one thousandth part of a unit. In this system, *terni*, the equivalent of *milli*, indicates the third decimal division of the unit, descending, as may be seen above, to its one thousandth part. The advantage of this plan of nomenclature, avoiding, as it does, the use of long, doubly and trebly compounded numerals in the higher and lower denominations, will appear as we proceed.

But the numerals of the system do really specify as distinctly, and, perhaps, more conveniently than those of the "Metric System," the actual products and fractions resulting form the multiplications and divisions of the units, which form the denominations of the system. For, it will be noted in the above table that our numerals invariably specify the *number of ciphers* required, when placed after the unit, to express the fraction resulting from a division, and the product of a multiplication. Thus, *tria*, indicating the third multiplication of the unit, specifies also the number of ciphers required to express the product; to wit, three, composing the multiple 1000. *Seni*, of the other series, indicating the sixth decimal division of the unit, specifies also, in the manner described, as the result of that division, the fraction, the 1000,000th part of the unit, expressed by six ciphers. So, *dua* specifies the multiple 100; and *primi*, the first division, specifies, by one cipher, $\frac{1}{10}$ of the unit, as the fraction arrived at by the first division.

In fact, for the use of Science (and the attention of scientific men is particularly invited to this feature of our nom-

enclature), the numerals of the system are not merely natural numbers. They are *logarithms* as well. They are the numerical exponents of a ratio. They form a series of numbers in arithmetical progression, susceptible of indefinite extension, and answering to another series of numbers in geometrical progression, also susceptible of indefinite extension. They are the logarithms of a system of logarithms whose base is 10. Thus:

hena	dua	tria	tetra	penta	hexa	&c.	arithmetical progression.
0	1	2	3	4	5	6 &c.	
1	10	100	1000	10000	100000	1000000 &c.	geometrical progression.

Our numerals, treated as logarithms, offer to science unlimited power of facile expression in the use of the system. Its units may be raised by geometrical progression to any required power, which will be instantly indicated by the appropriate logarithm. The application of the logarithms for the multiplication of the units is illustrated in the Synoptical View of the System hereto annexed. But the rule in question applies no less to the submultiples, or divisions of the units, than to their multiples.

Parallel Expressions under this System, in English or American Measures.

ENG. MEASURES. . 1,000,980,864 inches. (spoken or written) One thousand million, nine hundred and eighty thousand, eight hundred and sixty-four *inches*.

SYSTEMATIC. . . . . . 1,000,980,864 Linn. One thousand million, nine hundred and eighty thousand, eight hundred and sixty-four *Linn*.

OR

SYSTEMATIC. . . . . . Ten thousand and nine pent. L., eighty tri. L. eight hundred and sixty-four *Linn*.

AMR. MEASURES. . $53,286,395.73 (spoken or written). Fifty-three millions, two hundred and eighty-six thousand, three hundred and ninety-five *Dollars* and seventy-three *cents*.

SYSTEMATIC. . . . . . M.53,286,395.73. Fifty-three millions, two hundred and eighty-six thousand, three hundred ninety-five *Monn*, and seventy-three *bini*.

OR

SYSTEMATIC. . . . . . Fifty-three *hex.M.*, two hundred and eighty-six *tri. M.*, three hundred ninety-five *Monn*, and seventy-three *bini*.

The sum of 10,000,000,000 *Monn*, may be expressed in several forms, thus: *M.* 10,000,000,000 or *Decamonn*, or *dec.M.* or *Monn*^{10}, or simply *M.*^{10}, or written out as with Dollars, *Ten thousand million Monn.*

Lineal Measure, or Measures of Length.

UNIT—LINN.

The 1000,~~980,864th~~ 000,000th part of double the earth's Polar Diameter.

DENOMINATIONS.	VALUE LINN.	EQUIVALENT.	NEARLY EQUIVALENT (WITH UNIT OF 1 INCH).
Decalinn	10,000,000,000	157,983;09090909 miles.	157,828.2828 statute miles.
Pentalinn.......	100,000	1.57983 miles.	1.57828 miles.
Trialinn.......	1000	27.805024 yards.	27.7777777 imperial yards.
Dualinn.........	100	8.8415072 feet.	8.333333 feet.
Henalinn	10	10.00980864 inches.	10. inches of imperial yard.
LINN............	1 Linn.	1.000980864 "	1. " " "
Primilinn.......	$\frac{1}{10}$	.1 "	.1 " " "
Binilinn	$\frac{1}{100}$	.01 "	.01 " " "
Quartilinn......	$\frac{1}{10000}$	.0001 "	.0001 " " "
Senilinn	$\frac{1}{1000000}$	.000001 "	.000001 " " "

100	senilinn	(sL)	make	1	quartilinn
100	quartilinn	(qL)	"	1	binilinn
10	binilinn	(bL)	"	1	primilinn
10	primilinn	(prL)	"	1	LINN
10	LINN	(L)	"	1	henalinn
10	henalinn	(hL)	"	1	dualinn
10	dualinn	(dL)	"	1	trialinn
100	trialinn	(tL)	"	1	pentalinn
100000	pentalinn	(pL)	"	1	decalinn (dec.L.)

Measures of Area—Square Measure.

UNIT—ARR (1 *square Linn.*)

DENOMINATIONS.	VALUE.	NEARLY EQUIVALENT (WITH UNIT OF 1 SQ. INCH).
Decarr..........	10,000.000,000 square Linn.	2.49097668594 square miles.
Heptarr.........	10,000.000 " "	1.594225079 acres.
Pentarr.........	100,000 " "	77.1604938271 square yards.
Triarr	1000 " "	6.944444444 square feet.
Duarr...........	100 sq. Linn = 100.0980564 sq. inches.	100 square inches.
Henarr	10 " " = 10.00980864 " "	10 " "
ARR.............	1 " " = 1.000980864 " "	1 square inch.
Biniarr.........	$\frac{1}{100}$ square Linn.	.01 " "
Quartiarr	$\frac{1}{10000}$ " "	.0001 " "
Seniarr.	$\frac{1}{1000000}$ " "	.000001 square inch.

100	seniarr	(sA)	make	1	quartiarr
100	quartiarr	(qA)	"	1	biniarr
100	biniarr	(bA)	"	1	Arr
10	Arr	(A`)	"	1	henarr
10	henarr	(hA)	"	1	duarr
10	duarr	(dA)	"	1	triarr
100	triarr	(tA)	"	1	pentarr
100	pentarr	(pA)	"	1	heptarr
1000	heptarr	(hpA)	"	1	decarr (dec.A.)

Arr^{11} is almost exactly equivalent to 25 square miles; *Arr*^{12} to 250 square miles; and *Arr*^{13} to 2500 square miles. If a larger unit than the *decarr* be desired the expressions just cited may be employed for the measure of continents and even of astronomical planes. *Arr*^{17} offers a unit of the value of 25 millions square miles.

Measures of Solids, or of Volume.

Unit—SOLL (1 *cubic Linn*).

DENOMINATIONS.	VALUE.	NEARLY EQUIVALENT (WITH UNIT OF 1 CU. INCH).
Decasoll	10,000,000,000 cubic Linn.	214,334.7072 cubic yards.
Octasoll........	100,000,000 " "	2143.347 " "
Hexasoll..	1,000.000 " "	4.5211 cords = 21.4 cub. yds.
Tetrasoll.......	10.000 " "	5.787037 cubic feet.
Duasoll	100 cub. Linn = 100.0980864 cub. inches.	.057 cub. foot = 100 cub. in.
Soll...........	1 " " = 1.000980864 " "	1 cubic inch.
Binisoll........	$\frac{1}{100}$ cubic Linn.	.01 " "
Quartisoll	$\frac{1}{10000}$ " "	.0001 cubic inch.
Senisoll........	$\frac{1}{1000000}$ " "	.000001 " "

100	senisoll	(sS)	make	1	quartisoll
100	quartisoll	(qS)	"	1	binisoll
100	binisoll	(bS)	"	1	Soll
100	Soll	(S)	"	1	duasoll
100	duasoll	(dS)	"	1	tetrasoll
100	tetrasoll	(tS)	"	1	hexasoll
100	hexasoll	(hS)	"	1	octasoll
100	octasoll	(oS)	"	1	decasoll (dS)

Measures of Capacity.

UNIT—CAPP (1 *cubic Linn*).

DENOMINATIONS.	VALUE.	NEARLY EQUIVALENT (WITH UNIT OF 1 CUBIC INCH).
Decacapp. ...	10,000,000,000 cubic Linn.	143,116.69841 tuns.
Octacapp.....	100.000,000 "	2862.3339682 pipes.
Hexacapp....	1000.000 "	57.246679364 hogsheads.
Tetracapp....	10.000 "	4.508176 bushels = 36.0654 gallons.
Duacapp.	100 cub. Linn = 100.0980864 cub. in.	1.4426 quarts = 2.885 pints.
CAPP.	1 cubic Linn = 1.000980864 " "	1 cubic inch = .02885 "
Binicapp...	$\frac{1}{100}$ cubic Linn.	.01 " = .00028 "
Quarticapp...	$\frac{1}{10000}$ " "	.0001 "
Senicapp.....	$\frac{1}{1000000}$ " "	.000001 "

100	senicapp	(sC)	make	1	quarticapp
100	quarticapp	(qC)	"	1	binicapp
100	binicapp	(bC)	"	1	CAPP
100	CAPP	(C)	"	1	duacapp
100	duacapp	(dC)	"	1	tetracapp
100	tetracapp	(tC)	"	1	hexacapp
100	hexacapp	(hC)	"	1	octacapp
100	octacapp	(oC)	"	1	decacapp (dec.C.)

The Liquid and Dry Measures of Capacity under this system, in common use, would be of

1. 2. 5. 10. 20. 50. 75. 100.	Duacapp
1. 2. 5. 10. 20. 50. 75.	Capp
1. 2. 5. 10. 20. 50. 75.	Binicapp

Measures of Gravity—Weights.

UNIT—PONDD (1 *cubic Linn*).

DENOMINATIONS.	VALUE.	NEARLY EQUIVALENT (WITH UNIT OF 1 CUBIC INCH.)
Decapondd...	10,000,000,000 cubic Linn.	161,006.3775501020 *Tons.*
Octapondd...	100,000,000 "	32,201.275510204 cwt.
Hexapondd. .	1000,000 "	1288.051020408 quarters.
Tetrapondd..	10,000 "	360.654 lbs. av.d.p. = 438.295 lbs. troy.
Duapondd. ..	100 cub. Linn = 100.0980864 cub. in.	59.4 ounces av.d.p. = 52.595 troy ounces.
PONDD.......	1 cubic Linn = 1.000980864 " "	1 cubic inch = 4.2 drachms = 12.62 scruples.
Binipondd....	$\frac{1}{100}$ cubic Linn.	.126 scruple = 2.52 troy grains.
Quartipondd.	$\frac{1}{10000}$ " "	= .0252 " "
Senipondd. ..	$\frac{1}{1000000}$ " "	= 000252 " "

100	senipondd	(sP)	make	1	quartipondd
100	quartipondd	(qP)	"	1	binipondd
100	binipondd	(bP)	"	1	PONDD
100	PONDD	(P)	"	1	duapondd
100	duapondd	(dP)	"	1	tetrapondd
100	tetrapondd	(tP)	"	1	hexapondd
100	hexapondd	(hP)	"	1	octapondd
100	octapondd	(oP)	"	1	decapondd (decP.)

The weights in common use, under this system, would be of

1. 2. 5. 10. 20. 50.	Duapondd
1. 2. 5. 10. 20. 50. 75.	Pondd
1. 2. 5. 10. 20. 50. 75.	Binipondd
1. 2. 5. 10. 20. 50. 75.	Quartipondd

This System and the "Metric System" compared.

We cannot refrain from asking the reader to pause a moment here, and collating the two systems—the "Metric System," and this—to compare the completeness of this, with the relative and positive incompleteness of that. In square measure, that, with its only three denominations—the *hectare, are,* and *centiare*—affords very good agrarian measure for parceling the area of a commune, or county, among

its numerous proprietors. Nothing more. And nothing more was originally intended. This, affords facilities and appropriate terms for measuring all area. Its divisions, minute as Art, or even Science need, yet comprehensive as either can require, compass all area; from the point to a continent, and the whole earth's surface. In that, measures of volume are characterized by the same insufficiency; in this, by the same completeness. With its only three denominations—*decastère*, *stère*, *decistère*—that, possesses simply a measure of firewood. And such was the original intention. Yet it offers to-day, as a model and all-sufficient measure of solids—to the world for its thousand daily uses, to Science and Art, for their almost infinite requirements—nothing more comprehensive than the old measure of 2¾ cords of firewood, and nothing more minute than the 100th part of the same! Contemplate now the resources of this system; its senisoll (the millionth part of 1 cubic linn) at one extremity, and its decasoll (ten thousand million cubic linn) at the other—aye, and with the help of its logarithmic numerals—as much beyond these, in either direction, as you may please to ask for—and then say, which is the best adapted—which is the solely adapted for service as the one uniform system of nations.

Objections to the "Metric System."

In its lineal measure, in its measures of capacity, and of gravity, similar short-coming, though not in equal degree, is noticeable in the scheme of the "Metric System." It is difficult to characterize in respectful terms, the preposterous pretension to offer to the world, to Science and to Art, so shortcoming and incompetent a system, as sufficiently good, and perfectly well-adapted to effect metrological uniformity; and to insist, too, upon the world's immediate and "unconditional surrender!" It must be accepted, forsooth! just as it is; *verbatim et literatim et punctuatim*; with its scheme unmodified, with its unmodified names, and their very spelling! 'Tis pity its advocates

cannot transmit withal, to us stiff-tongued British and American subjects, faculty and facility for decent pronunciation of the French phrases thus to be forced upon us. The French, we apprehend, would fail to recognize the names of their own begotten, as they would assuredly hear these names ejected from the vocal organs of nearly all of us. We half suspect the abettors of this scheme of conspiracy with the *Charivari*, to supply perpetual fund of fun for the amusement of Paris, in these rather sad days of the gay city.

These pressing advocates of the adoption of the "Metric System" are well aware that if they admit any imperfection or incompetence in it, and once place it on the stocks for repair, not one alone, but very many will be found, of such crying necessity that, as was the case formerly with the frigate *Constitution*, nothing will be left of the original glorious old ship. Once send the system to the shop to be mended, and inevitably it will have to undergo such thorough overhauling and modification, it will be so spliced, and peeled, and pared, so bedecked with incongruous improvements and amendments, that, by and by, when it leaves the shop, the "Metric System," like the famous old woman in nursery literature, will become exceedingly unsure of its own identity. If it have a "dog Schneider"—and doubtless it has—even "Schneider" wouldn't know it.

Insufficiency of French Numerals.

In fact, French numerals, by the very scheme of the system, lack the power to express our higher and lower denominations, except by doubly and trebly compounded terms, which it would be absurd to propose; such, for instance, as *déca-myri-myriamètre,* milli-milli-milli stère, hecto-myri-myriare, kilo-myriagramme, etc. It is thus demonstrated that the "Metric" nomenclature does not suffice; and cannot, by any artistic tinkering, be made to suffice for a *complete* metrological system. Indeed, it confesses its own

insufficiency, and gives up in despair, by bolting its track, retaining the style of "*tonneau,*" old-fashioned and homely as it is, rather than undergo the systematic, sesquipedalic denomination of *hecto-myriagramme;* and by calling its weight of 100 kilogrammes "*quintal metrique*" instead of *déca-myriagramme.*

"*Metric*" *Nomenclature Criticized.*

We may remark here, by the way—though very probably the remark will be styled, if not deemed, pedantic and hypercritical—that "*hecto,*" of the "Metric" numerals, seems to be unskillfully derived from the Greek. It is announced as coming from ἑκατόν, and meaning *hundred.* But a scholar, not aware of the announcement, nor of the intention of the founders of "Metric" nomenclature, would indubitably seek the origin of "*hecto*" in the Greek numeral adjective, or ordinal number, ἕκτος (sixth). *Heca* (as in hecatomb, hecatonpedon, hecatonstylon) would be the regular and correct derivation from the Greek, for use in "Metric" nomenclature, in place of "*hecto.*" We do not, therefore, it is confessed, like the words, *hectomètre, hectare, hectolitre, hectogramme;* nor relish the idea of being hectored into the acceptance of these unclassic solecisms, and of embalming and cementing them in a metrological system intended for common use by all Latin-and-Greek-respecting and civilized nations. We would reject those denominations, even if they came to us *ex cathedrâ,* from that fountain-head of classical learning, Oxford University. But, most likely, we could not get them from that institution. They have a bad odor, no matter how, nor by whom presented. *Kilometre, kilolitre, kilogramme,* etc., are also solecistic expressions, and, though not so grossly peccant as the "*hectos,*" are yet non-acceptable. *Chili,* for the numeral 1000, would be a far more regular and correct derivative than "*kilo.*" We trust that our language will never be infected by the inoculation into it of this vicious foreign matter. We conclude of all these

words—and therefore would exclude them—though greeky, they are not Greek, though frenchy, they are not French.

The Simplicity, Unity, and Harmony of the System.

It is one of the characteristics of the System, recommending it particularly to the acceptance of scientific men, and to general adoption, that the several parts bear a far more direct and simple and scientific relation to the base, and to each other, than obtains in the "Metric System" of France. Each unit being immediately derived from the base-linn itself, and not from a multiple, or from a fraction of it—the soll and capp and pondd being cubes of the linn, and the arr its square—there results, for the whole, a seemly and practically useful harmony, which is wanting in the metrical system. In the last-named system, the *are* is the square of a *décamètre;* the *litre* is the cube of a *décimètre;* the *gramme* is the cube of a *centimètre,* and the *stère* alone comes immediately from the *mètre* itself, being its cube. From this variety springs a confusion, in reference to the *mètre,* of the numerals employed to form the several denominations—a confusion which is distracting to most minds, and which mars the beauty of the system as a whole. The harmony referred to, and the parallelism of the several departments, are made apparent to the eye, as well as to the mind, by inspection of the Synoptical View hereto annexed.

Its Practical Convenience.

This harmony has been spoken of as not only seemly, but practically useful. In proof, be it remarked, that it puts to every man's hand, and in the possession of every family, for domestic purposes, a ready, convenient, and perfectly simple substitute for any of the regular systematic weights or measures—a substitute, not of scientific exactness, but very nearly equivalent; sufficiently so for all ordinary purposes. In a 1 capp measure of common water, we have the equivalent of a 1 pondd weight. In a 1 pondd weight of ordinary water,

weighed in any convenient vessel, we have the content of a 1 capp measure. And this is true, reciprocally, of all the measures and weights, from the highest to the lowest. *The equivalent in water, weighed in any convenient vessel, of any of the pondd weights, gives the content of its numerically corresponding capp measure. Any of the capp measures, filled with water, supplies the weight of its numerically corresponding pondd.* Indeed, it will be only necessary to know the contents in capp, of any vase, can, barrel, hogshead, or reservoir containing liquids, to tell instantly, with fair approach to accuracy, its actual weight in pondd, by the simple mental substitution of "pondd" for "capp." Very small quantities of liquids, even of liquid medicines, would be, perhaps, more conveniently and accurately ascertained by weight than by measures of *capacity*.

It is time to have done, in scientific parlance, with those inexact, uncertain expressions, so common in pharmacy, and in the practice of medicine, tea-spoonful, table-spoonful, and drops, unless, indeed—which is much to be desired—the several sizes of spoons were modeled, by common consent of manufacturers, upon well-known systematic quantities. This idea would, probably, soon be realized, if a metrical system providing such quantities, were generally adopted by the nations.

It is urged against a decimal system of measures and weights, that it "has been found, in practice, unsuited to the purposes of retail traffic, to which, in fact, only a binary system, or the division of the unit into halves and quarters, seems applicable." Now, it is asked, in all seriousness, if, with any candor, or justice, or common sense, such objection can lie against the Decimal System here described? All of its units—measures and weights—to be upon all counters, and daily used in "retail traffic," *are divided into hundredths.* Is it not just as easy, we demand, and just as convenient to ask for, to give, and to receive *seventy-five per cent.* of an article as "three-quarters?" or *fifty per cent.* as "half?" or *twenty-five per cent.* as "a quarter?" And are not those

terms, for all the "purposes of retail traffic," respectively equivalent? The use of the American dollar, divided into cents, is found to be perfectly convenient, decimal though it be; and no need whatever is experienced of a purely "binary" division.

Money.

Unit—MONN.

THE AMERICAN DOLLAR.

DENOMINATIONS.	VALUE MONN.	VALUE DOLLARS.
Decamonn............	10,000.000,000	10,000,000,000
Hexamonn............	1,000,000	1,000,000
Triamonn............	1,000	1,000
Monn................	1 unit.	1 dollar
Binimonn............	$\frac{1}{100}$	.01=1 cent
Quartimonn..........	$\frac{1}{10000}$	.0001=.1 mill.

100	quartimonn	(qM)	make	1 binimonn
100	binimonn	(bM)	"	1 Monn.
1000	Monn	(M)	"	1 triamonn.
1000	triamonn	(tM)	"	1 hexamonn.
10,000	hexamonn	(hM)	"	1 decamonn (decM.)

Coins of the System.

✱

DENOMINATIONS.	VALUE
Gold.	
Dis-[redacted]-Henamonn.........	20 monn=20 Dollars
Henamonn................	10 " =10 "
Semi-Henamonn..........	5 " = 5 "
Silver.	
Monn.....................	1 monn= 1 Dollar.
50 binimonn..............	.5 " =50 cents.
25 binimonn..............	.25 " =25 cents.
10 binimonn..............	.10 " =10 cents.
5 binimonn..............	.05 " = 5 cents.
Copper.	
2 binimonn..............	.02 Monn= 2 cents.
1 binimonn..............	.01 " = 1 cent.
50 quartimonn............	.0005 " = .5 "

2

✱ dis (Gr. twice, double, two)

In order to familiarize the people promptly as possible with the new system, and for their real convenience too, in that it would enable them, in emergencies, to establish and verify its weights and measures; the diameter and weight of coins—particularly of the silver and copper coins—should be stamped upon one of their faces; and a graduated line, divided into binilinn, drawn through the centre. By these means, in connection with the use of the capp and binicapp, as above described—and when the reformation of spoons, as previously suggested, shall be effected—it would not be long after the adoption of the system, ere every family in Christendom, without any special effort to that end, and without a teacher, might become perfectly acquainted with the theory of the system, and able to extemporize for prompt daily use, in town and country, in hut and palace, in the workshop, in the kitchen, in the parlor, its three practical units, the linn, capp, and pondd, with their multiples and fractions. Indeed, a single centt, if stamped as recommended, could, in case of need, supply all of the three units. Its diameter would establish the linn. Its weight would give the pondd. The pondd and a mug of water would establish the capp.

Circular Measure (for Angles).

UNIT—GRADD.

(The 1000th part of the Circle.)

This system adjusts decimal processes to the circle for the measure of angles, by dividing the circumference into such a number of equal decimal parts, that 100 of them are equal to a new minute; 100 minutes to a new degree; and 1000 degrees to the whole circle. The embarrassing and inconvenient sexagesimal divisions are abolished; and the embarrassing and inconvenient terms for those divisions, *minutes* and *seconds*, used for the circle, in common with time measure, are also abolished. The new degree, or *Gradd*, as it is styled in the nomenclature of the system, becomes the 1000th part of the circumference; the semi-circle, of 500°,

instead of 180°; and the quadrant, of 250° instead of 90°. The new division runs thus:

DENOMINATIONS.		VALUE.		
Circc	=	1000 Gradd	=	circumference
GRADD (unit)	=	1 "	=	.001
Binigradd	=	$\frac{1}{100}$ "	=	.00001
Quartigradd	=	$\frac{1}{10000}$ "	=	.0000001

100	quartigradd	(qG)	make	1	binigradd	
100	binigradd	(bG)	"	1	Gradd	
1000	GRADD	(G)	"	1	CIRCC	(C.)

In the above mode of decimalizing the circumference, the unit, quartigradd, or tempp (Lat. *tempus*, time), may be taken, indifferently, as representing either .1296 of the seconds composing the 360 degrees of the circle; or 3.155692965696 of the seconds composing a tropical year; or 3.16445507495424 of the seconds composing a sidereal year.

And why should not sexagesimal divisions be expelled at once from measures of time, as from other measures, and from money, by declaring that 100 *secc* make 1 *minn*, and 100 minn 1 hour? No change, other than this, in the denominations of time measure, or of the civil year, would be necessary, so long as the system may be confined to English-speaking nations. But, in the event of its adoption by other nations, and becoming wholly or largely the one common system, then, the systematic nomenclature should be adjusted to Annal Measure thus:

100	tempp	make	1	minn	(Lat *minutia*, mite.)
100	minn	"	1	horr	(Lat. *hora*, hour.)
24	horr	"	1	dimm	(Lat. *diem*, day.)
7	dimm	"	1	septt	(Lat. *septem*, seven.)
30	dimm	"	1	menss	(Lat. *mensis*, month.)
12	menss	"	1	ann	(Lat. *annus*, year.)

The names of the *days of the week* would become: A.dimm, B.dimm, C.dimm, D.dimm, E.dimm, F.dimm, G.dimm.

The *months of the year* would be called: A.menss, B.menss, C.menss, D.menss, E.menss, F.menss, G.menss, H.menss, I.menss, J.menss, K.menss, L.menss.

Thermal Measure—Thermometer.

UNIT—DEGG.

This system proposes a modified graduation of the scale of the thermometer for measuring variations of heat or temperature. *Fahrenheit's* scale, it is generally conceded, is ill-adapted to philosophical uses, and has been almost abandoned. Its only advantage lies in the comparative lowness of its zero point, and minuteness of its divisions. *Reaumer's* thermometer is now rarely used in works of science. The non-decimal character of its graduation has caused it to be almost everywhere superseded for scientific purposes by the Celsius, or *Centigrade* thermometer. This last, which, in harmony with decimal arithmetic, divides the space between the freezing and boiling points of water into 100 equal parts, has won for itself general acceptance among scientific men. But it has been objected to the Centigrade scale—and the objection lies equally against Reaumer's—that because of the high point at which *zero* is placed, meteorological observations are embarrassed with the algebraic signs of *plus* and *minus*. It lacks, also, the other advantage of the Fahrenheit scale, minuteness of division.

The new graduation recommended by this system obviates both these objections, and leaves the convenient decimal character of the scale unharmed. It is proposed to mark the scale, thus:

ZERO.	FREEZING.	BOILING.
0 degg	200 degg	400 degg

One division of the degg into primidegg, or tenths, would perhaps be advisable.

By this reformed scale it is instantly perceived, without the aid of algebra, that all below 200 degrees is below the freezing point; that all above 200 degrees, and below 400, is between the freezing and boiling points; and that all above

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Decimal Scale divides the in-
and boiling points of water
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above zero, and the boiling
is divided decimally into tenths

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titled: A New Decimal Metri-
Earth's Polar Diameter, and
Civilized Nations as the One
perforce Mann, author of "The
University Publishing Company,
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between the freezing and boiling points, and ...

400 degrees, is above the boiling point. Moreover, throughout the scale, there is obtained, in minuteness of division, 2 degrees in place of 1 by the centigrade. But if this be deemed a too minute division, mark,

Zero . Freezing . 100 Boiling . 200

Last Words.

The New Decimal Metrical System, founded thus upon the Earth's Polar Axis—which is conceded to be the best geodetical basis known, and is probably, the best basis possible—is now submitted to the criticism of Science and the judgment of the world. Severe as you please, be candid, impartial, and just. It is believed by its author to be the purest, and, theoretically, the most perfect system of measures, weights, and money, that has yet been constructed. It pretends to adoption as the one common system, destined to realize that idea of metrological uniformity among the nations which has so long been a dream of the philanthropist, the hope of Science, the demand of Art, the want of the world. It was conceived, and has been constructed with an eye single to that end. And it is held to have been, in most, if not all of its departments, successfully adapted to the end in view. The author has borne constantly in mind that his system, while it was to be the help-mate of Art, and the hand-maid of Science, was, above all, to be the ever-present, familiar, and ever-useful friend of mankind in general; in the common practical employ, every day, of everybody everywhere, in all the walks and avocations of life. And he presumes to have effected, that while his system serves, and well serves this end; it responds also to the behests of Science. While the frugal housewife in the kitchen, may be using the capp and poundd in the composition of a plum-pudding, and her oldest daughter, in the parlor, freely tasking the linn for the composition of a new dress, and the artisan, in his shop, momently applying the system, its useful and indispensable

implements will be found in the chemist's laboratory and in the observatory of the astronomer. Science may compute the waters of the ocean with the capp, weigh the mass of our globe with the pondd, and then, stepping off this earth into the universe without, measure the volume of the sun itself with the soll, the plane of its orbit, with the arr, its distance, and that of the remotest star beyond it, with the linn.

The author would remark, in conclusion, that he is not, and does not pretend to be, a thoroughbred man of science. In matter of science, he is but a "sciolist civilian." It is quite possible that, without being aware of it, he has proven this, plainly enough, to the thoroughbred professors. If so, let them show it; but let the modesty and candor of the above confession mollify the criticism of honest and completely armed science. Its criticism will be received respectfully and humbly. As for the Schneiders of the "quadrant-metre," they will doubtless, in such event, bark and snap furiously at him. Let them.

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LI

(The one thousand million, ~~nine hundred and eighty thousand, eight hundred~~

LOGARITHMS.			LENGTH.	AREA.	VOLUME.	CAPACI
	Numerals of the system.	*Value of the units.*				
	15	10^{15}	Linn^{15}		Soll^{15}	
	14	10^{14}				C.^{14}
	13	10^{13}		A.^{13}		
	12	1000000000000	Linn^{12}			
	11	100000000000	L.^{11}	Arr^{11}		
10	deca	10000000000	Decalinn	Decarr	Decasoll	Decacap
9	enna	1000000000				
8	octa	100000000			Octasoll	Octaca
7	hepta	10000000		Heptarr		
6	hexa	1000000			Hexasoll	Hexaca
5	penta	100000	Pentalinn	Pentarr		
4	tetra	10000			Tetrasoll	Tetraca
3	tria	1000	Trialinn	Triarr		
2	dua	100	Dualinn	Duarr	Duasoll	Duacap
1	hena	10	Henalinn	Henarr		
0	UNIT	1 UNIT	LINN	ARR	SOLL.	CAPP
1	primi	$\frac{1}{10}$	Primilinn			
2	bini	$\frac{1}{100}$	Binilinn	Biniarr	Binisoll	Binicap
3	terni	$\frac{1}{1000}$				
4	quarti	$\frac{1}{10000}$	Quartilinn	Quartiarr	Quartisoll	Quartic
5	quini	$\frac{1}{100000}$				
6	seni	$\frac{1}{1000000}$	Senilinn	Seniarr	Senisoll	Senicap
	7					
	8					
	9					
	10					

V OF THE SYSTEM.

L UNIT

N N.

~~and sixty-fourth~~ [1000,~~960,864th~~ 000,000*] part of double the Earth's Polar Diameter.)

TY.	WEIGHT.	MONEY.	THE CIRCLE. (*for angles.*)	HEAT. *Thermometer.*
		Monn^{15}		
	Pondd^{12}	M.^{12}		
p	Decapondd	Decamonn		1000 Degg
[illegible]	Octapondd			800 Degg
pp	Hexapondd	Hexamonn		600 Degg
				500 "
pp	Tetrapondd			*Boiling,* 400 Degg
		Triamonn	Circc	300 "
p	Duapondd			*Freezing,* 200 Degg
				-100 "
	Pondd	Monn	Gradd	*Zero,* 0 Degg
				primidegg .1 D.
p	Binipondd	Binimonn	Binigradd	
app	Quartipondd	Quartimonn	Quartigradd	
pp	Senipondd			

A NEW SYSTEM OF MEASURES, WEIGHTS, AND MONEY;

ENTITLED

THE LINN-BASE DECIMAL SYSTEM;

AND

DESIGNED FOR THE ADOPTION OF ALL CIVILIZED NATIONS,

AS

THE ONE COMMON SYSTEM.

BY

W. WILBERFORCE MANN.

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OF

MEASURES, WEIGHTS, AND MONEY.

THE base of the new system of measures and weights, here offered to the consideration of Science and Commerce, and to the statesmen and Governments of the World, is its unit of linear measure or measures of length.

The one hundred millionth (100,000,000th) *part of the quadrant of the earth's meridian*, or the one hundred millionth part of the distance from the equator to the pole, is assumed as its unit of lineal measure.

The justly celebrated and admirable "Metrical System" of France has previously taken for its standard the quadrant of the earth's meridian; and it establishes the *mètre*—the ten millionth part of the quadrant—as its unit of lineal measure and base. The expediency of assuming the *one hundred millionth*, instead of the *ten millionth* part of the quadrant, as the unit of the new system, will, it is believed, become apparent in the sequel. This length of ten million *mètres*, as the distance from the equator to the pole, was deduced from the great trigonometrical measurement of the meridian from Dunkirk to Barcelona, in 1806–7. From comparison of English standards with a copy of the *mètre* in possession of the Royal Society, Capt. Kater found the length of the *mètre* to be 39.37079 of the inches English standard (Phil. Trans., 1818). Mr. Bailly found the length of the *mètre* to be 39.3696786 inches of the Royal Astronomical Society's scale (Mem. R. A. S., vol. ix. page 133); from

which, by reducing to the imperial standard, by the data given in the same memoir, the true length of the *mètre* is 39.370091 inches of the imperial yard. It is *one tenth* of this length—3.9370091 *inches of the British imperial yard*—which has been fixed upon as the *unit of lineal measure and base* of the new system of decimal measures and weights here described, and from which all its calculations are deduced.

NOMENCLATURE.—The nomenclature of the system has been invented with special regard to conditions of acceptability by all nations. The fitness and utility that would make names, throughout the system, indicate the nature of the thing named, were also borne in mind. The six units are called—

Linn (Lat. *linea*, a line) unit of lineal measure, or of length.

Arr (Lat. *area*, surface, area) unit of square measure, or of area.

Soll (Lat. *solidus*, solid) unit of solid measure, or of volume.

Capp (Lat. *capacitas*, capacity) unit of liquid and dry measure, or of capacity.

Pondd (Lat. *pondo*, weight) unit of gravity, or of weights.

Monn (Lat. *moneta*, money, coin) unit of money.

The unmistakeable cosmopolitan character of these names seems to fit them for general adoption. Neither by form nor origin do they point to any particular modern country. They can neither gratify nor wound the *amour propre* of any existing people. They are short, being all monosyllabic, and of easy utterance, beginning and ending with different letters, so that there can be no possible confusion among them, of sound. Throughout all the denominations, they are invariable, having no plural termination. We say: 1 linn, 25 linn—1 pondd, 85 pondd. Moreover, these names, to the ear and to the mind, by sound, as by origin, are instantly suggestive of the thing signified. *Linn* suggests lineal measure, and gives its name to the system. Arr suggests measures of area. Soll suggests solids; capp, capacity; pondd, weights; and monn, money. It should be especially noted, also, that in all the languages of Europe, very nearly the same pronunciation must be popularly given to these names of the units. By the ac-

cepted rules of pronunciation, the sound of the words when uttered, cannot materially vary, wherever the letters of our language are used. But the final consonants must remain double, or grave variations of pronunciation will ensue.

The value of the several units is as follows:

LINN, the 100,000,000th part of the quadrant of the earth's meridian.		
ARR, an area, or superficies of	1	square linn.
SOLL, a volume, or bulk of	1	cubic linn.
CAPP, a vessel whose capacity is of	1	" "
PONDD, the weight of distilled water	1	" "
MONN, a silver coin of the value of 5 francs.		

The multiples and divisions or fractions of the units.

All the multiples and fractions of the several units are *decimal;* and the denominations are formed by prefixing to the names of the units Greek numerals, from one to ten, to designate the multiples, and Latin numerals, from one to six, to designate the fractions. But, in the formation of the denominations, the seventh and ninth numerals of the ascending series, or multiples, and the fifth of the descending series, do not appear. The numerals are—

DECA (Gr. δέκα, ten)	tenth	multiple	10,000,000,000
ENNA (Gr. ἐννέα, nine)	ninth	"	1000,000,000
OCTA (Gr. ὄκτω, eight)	eighth	"	100,000,000
HEPTA (Gr. ἑπτά, seven)	seventh	"	10,000,000
HEXA (Gr. ἕξ, six)	sixth	"	1000,000
PENTA (Gr. πέντε, five)	fifth	"	100,000
TETRA (Gr. τέτρα, four)	fourth	"	10,000
TRIA (Gr. τρία, three)	third	"	1000
DUA (Gr. δύο, two)	second	"	100
HENA (Gr. ἕνα, one)	first	"	10
Unit			1
PRIMI (Lat. primi, first)	first	division	$\frac{1}{10}$
BINI (Lat. bini, two)	second	"	$\frac{1}{100}$
TERNI (Lat. terni, three)	third	"	$\frac{1}{1000}$
QUARTI (Lat. quarti, four)	fourth	"	$\frac{1}{10000}$
QUINI (Lat. quini, five)	fifth	"	$\frac{1}{100000}$
SENI (Lat. seni, six)	sixth	"	$\frac{1}{1000000}$

In this system, the numerals employed do not—as in the French "Metrical System"—indicate the products resulting from multiplication of the units, nor the fractions resulting from their division; but they indicate the number and order of the several multiplications and divisions. To illustrate: *myria*, in the "Metrical System," expresses the multiple 10,000. In this system, *tetra*, the equivalent of *myria*, indicates the fourth decimal multiplication of the unit, producing, as is seen in the above table, the same multiple, 10,000. In the descending series, or divisions of the units, *milli* of the "Metrical System" expresses the one thousandth part of the unit. In this system, *terni*, the equivalent of *milli*, indicates the third decimal division of the unit, descending, as may be seen above, to its one thousandth part. The advantage of this plan of nomenclature, avoiding, as it does, the use of long, doubly and trebly compounded numerals in the higher and lower denominations, will appear as we proceed.

But the numerals of the Linn-base System do really specify as distinctly, and, perhaps, more conveniently than those of the "Metrical System," the actual products and fractions resulting from the multiplications and divisions of the units, which form the denominations of the system. For, it will be noted in the above table that our numerals invariably specify the *number of ciphers* required, when placed after the unit, to express the fraction resulting from a division, and the product of a multiplication. Thus, *tria*, indicating the third multiplication of the unit, specifies also the number of ciphers required to express the product; to wit, three, composing the multiple 1000. *Seni*, of the other series, indicating the sixth decimal division of the unit, specifies also, in the manner described, as the result of that division, the fraction, the 1000,000th part of the unit, expressed by six ciphers. So, *dua* specifies the multiple 100; and *primi*, the first division, specifies, by one cipher, $\frac{1}{10}$ of the unit, as the fraction arrived at by the first division.

In fact, for the use of Science (and the attention of scientific men is particularly invited to this feature of our nomenclature), the numerals of the system are not merely natural numbers.

They are *logarithms*, as well. They are the numerical exponents of a ratio. They form a series of numbers in arithmetical progression, susceptible of indefinite extension, and answering to another series of numbers in geometrical progression, also susceptible of indefinite extension. They are the logarithms of a system of logarithms whose base is 10. Thus:

hena.	dua.	tria.	tetra.	penta.	hexa.	&c.	} arithmetical progression.
0.	1.	2.	3.	4.	5.	6.	&c.	
1.	10.	100.	1000.	10000.	100000.	1000000.	&c.	geometrical progression.

Our numerals, treated as logarithms, offer to science unlimited power of facile expression in the use of the Linn-base System. Its units may be raised by geometrical progression to any required power, which will be instantly indicated by the appropriate logarithm. The application of the logarithms for the multiplication of the units is illustrated in the Synoptical Comparative Table hereto annexed. But the rule in question applies no less to the submultiples, or divisions of the units, than to their multiples. In the monetary department of this system, logarithms, applied to the very large amounts prevalent now-a-days in the budgets and treasury reports of all nations, afford facilities that can hardly fail to be appreciated. The sum of one hundred million Monn, which, in natural numbers, must be expressed by eight ciphers after unit, is announced under the Linn-base Decimal System, by either of three short forms. It may be written *octamonn*, or more shortly, *Monn*^{8}, or simply M^{8}. Decamon, or Monn^{10}, or M^{10}, signifies ten thousand million (10,000,000,000) Monn; Monn^{11}, or M^{11}, one hundred thousand million; the numeral logarithm annexed to Monn, always indicating the number of ciphers required after unit to express the sum in natural numbers.

DENOMINATIONS.

Lineal, or Long Measure—Unit LINN.

Denominations.	Value linn.	American and English equivalents.	French.
Octalinn....	100,000,000	6213.713857 British statute miles.	
Pentalinn ..	100,000	6.2137 miles.	myriamètre.
Tetralinn...	10,000	0.62 mile = 1093.613639 yards.	kilomètre.
Dualinn	100	10.936 British imperial yards.	decamètre.
Henalinn ...	10	1.0936 yards = 39.37 inches.	mètre.
Linn.......	1	3.9370091 inches of imperial yard.	decimètre.
Primilinn...	$\frac{1}{10}$	0.3937 inch.	centimètre.
Binilinn	$\frac{1}{100}$	0.039370091 inch.	millimètre.

10	binilinn	(bnL)	make	1	primilinn
10	primilinn	(pmL)	"	1	linn
10	linn	(L)	"	1	henalinn
10	henalinn	(hL)	"	1	dualinn
100	dualinn	(dL)	"	1	tetralinn
10	tetralinn	(tL)	"	1	pentalinn
1000	pentalinn	(pL)	"	1	octalinn (oL)

The henalinn, divided into linn and primilinn (tenths and hundredths), would serve in commerce as our yard.

The tetralinn and dualinn would be the common itinerary measure, as we now use the mile and yard. Perhaps, as distances in the United States are so great, it would prove more convenient there to take the pentalinn as the usual measure of itinerary distance. The dualinn, double dualinn, and demi-dualinn would be used—as are their equivalents in France—for surveyors' chains, each link having the length of two linn.

The octalinn is given for the rendering of immense astronomical distances and other scientific uses. For such purposes, it is far more convenient and appropriate than any of the infinite variety of leagues and miles in common use all over the world, or than the French myriamètre. Astronomical distances are so great, that they are quite inconceivable when expressed in miles; but the octalinn would promptly convey to the popular mind, and to intelligent youth, a definite and correct idea of

many of them, for it will be remarked that the octalinn has precisely the length of the standard-base of this new system of measures. It is the quadrant of the earth's meridian—*one hundred million linn*—the distance from the equator to the pole—exactly one fourth of the circumference of the earth. It is fitting, then, that the octalinn should be accepted as the measure of astronomical distances.

DENOMINATIONS.

Measures of Superficies, or Square Measure—Unit ARR.

DENOMINATIONS.	VALUE ARR.	AMERICAN AND ENGLISH EQUIVALENTS.	FRENCH.
Decarr ...	10,000,000,000	38.6102399 square miles.	
Octarr....	100,000,000	0.3861 sq. mile = 247.1 acres.	
Hexarr ...	1000,000	2.47105535364 acres.	hectare.
Tetrarr ...	10,000	0.0247 acre = 119.519 sq. yards.	Are.
Duarr	100	1.195990791164 square yards.	centiare.
Arr	1	0.10763917120474 square feet.	
Biniarr ...	$\frac{1}{100}$	0.1550004065348281 square inch.	
Quartiarr .	$\frac{1}{10000}$	0.001550004 sq. inch = sq. binilinn.	

100	quartiarr	(qA)	make	1	biniarr
100	biniarr	(bA)	"	1	Arr
100	Arr	(A)	"	1	duarr
100	duarr	(dA)	"	1	tetrarr
100	tetrarr	(tA)	"	1	hexarr
100	hexarr	(hA)	"	1	octarr
100	octarr	(oA)	"	1	decarr

The decarr will serve to measure the area of continents, States, provinces, and all very large tracts of territory, more conveniently than the irregular vague quantities known as "square leagues," and "square miles," of which nearly all countries have their own, differing from others. The decarr is one square pentalinn. For other less extensive yet large bodies of land, the octarr—one square tetralinn—may be employed.

The hexarr, tetrarr, and duarr—equivalents of the French

hectare, are, and centiare—would be used, as the acre with us, for measuring smaller bodies of land, farms, lots, etc.

The French "Metrical System" is defective, and unfit for adoption as the universal system, in that it makes no provision for the measurement of area or surface, over the hexarr, nor under the duarr. It simply provides very limited agrarian measure; whereas the Linn-base System provides for the measure of all area, from that of a pin's head to a continent, the decarr containing thirty-eight and a half square miles, and the quartiarr, one square binilinn.

The decarr is the equivalent of 1 square *myriamètre* of the French system; and the quartiarr, of 1 square *millimètre.*

DENOMINATIONS.

Measures of Volume, or of Solids—Unit SOLL.

DENOMINATIONS.	VALUE SOLL.	ENGLISH AND AMERICAN EQUIVALENTS.	FRENCH.
Octasoll....	100,000,000	130,795.184 cubic yards.	
Hexasoll...	1000,000	1307.95 " "	
Tetrasoll...	10,000	2.759 cords = 13.0795 cubic yards.	décastère.
Duasoll....	100	3.53146997124605148551 cubic feet.	décistère.
Soll......	1	61.0238011031317696635 cubic inches.	
Binisoll....	$\frac{1}{100}$	0.61 cubic inch.	
Quartisoll..	$\frac{1}{10000}$	0.0061 cubic inch.	
Senisoll....	$\frac{1}{1000000}$	0.000061 cubic inch = cubic binilinn.	

100	senisoll	(sS)	make	1	quartisoll
100	quartisoll	(qS)	"	1	binisoll
100	binisoll	(bS)	"	1	Soll
100	Soll	(S)	"	1	duasoll
100	duasoll	(dS)	"	1	tetrasoll
100	tetrasoll	(tS)	"	1	hexasoll
100	hexasoll	(hS)	"	1	octasoll (oS)

The department of the French "Metrical System" corresponding with this, is, like the last, (square measure), very shortcoming. It is not worthy to be accepted in a general

system, as affording a satisfactory measure of solids. It affords simply—and was so intended—a measure of firewood. The Linn-base Decimal System, in its department of solid measures, completely supplies the desideratum; affording denominations which cover all bulks, from the cubic binilinn to 100,000,000 cubic linn—from sixty-one millionth parts of a cubic inch (cubic *millimètre*), to hundreds of thousands cubic yards.

In fact, the French system lacks the power to express our highest and lowest denominations, except by terms of impossible acceptance. For instance: Its equivalent of our quartiarr would be *centi-milli-milliare;* and of our decarr, *hecto-myriare.* Our senisoll would be found in *milli-milli-millistère;* and our octasoll, in *déca-myriastère.* Our octalinn would be recognized in *kilo-myriamètre.* It is thus demonstrated that the French nomenclature will not suffice for a complete metrical system. Indeed, it confesses its own insufficiency, and gives up in despair, by retaining the old style of "*tonneau*" rather than accept the systematic denomination of *hecto-myriagramme;* and by calling its weight of 100 kilogrammes, *Quintal Métrique*, instead of *déca-myriagramme.*

DENOMINATIONS.

Measures of Capacity—Liquid and Dry Measure—Unit CAPP.

DENOMINATIONS.	VALUE CAPP.	BRITISH AND AMERICAN EQUIVALENTS.	FRENCH.
Triacapp..	1000	220.08 gal. = 27.51 bushels = 1.048 tuns.	kilolitre.
Duacapp..	100	2.751 bushels = 22.008 imperial gallons.	hectolitre.
Capp	1	1.76068 pints = 0.88 quart.	Litre.
Binicapp..	$\frac{1}{100}$	0.0176068 pint.	centilitre.
Ternicapp.	$\frac{1}{1000}$	0.00176 pint = 1 cubic primilinn.	
Senicapp..	$\frac{1}{1000000}$	0.00000176 pint.	

1000	senicapp	(sC)	make	1	ternicapp	
10	ternicapp	(tnC)	"	1	binicapp	
100	binicapp	(bC)	"	1	Capp	
100	Capp	(C)	"	1	duacapp	
10	duacapp	(dC)	"	1	triacapp	(tC)

Liquid and Dry Measures of capacity in common use, would be as below :

MEASURES OF	AMERICAN AND ENGLISH EQUIVALENTS.	FRENCH.
100 Capp	22.008 gallons = 2.751 bushels	1 hectolitre.
50 "	11.004 " = 1.3755 "	5 décalitres.
20 "	4.4016 " = 0.54 " = 2.2 pecks.	2 "
10 "	8.80339 quarts=1.10 pecks=17.6 pints.	1 "
5 "	4.4 " =0.55 " =8.8 "	5 Litres.
2 "	1.760678638 " =3.52136 "	2 "
1 "	0.880339319 " =1.76068 "	1 "
50 binicapp	0.44 " =0.88 "	5 décilitres.
25 "	0.44 pints	2.5 "
10 "	0.176 "	1 "
5 "	0.088 "	5 centilitres.
2 "	0.0352 "	2 "
1 "	0.0176 "	1 "
5 ternicapp	0.0088 "	5 millilitres.
2 "	0.00352 "	2 "
1 "	0.00176 "	1 "

1 . 25 . 50 . 75 . 100 . 250 . 500 . 750 senicapp.

Measures of 10, 20, 50, and 100 capp, made of wood, are used in French dry measure, as we use the bushel, half-bushel, peck, etc.

A metrical system which aims at completeness, and seeks universal adoption—which would satisfy all needs, and meet all reasonable requirements—which descends, in its measures of area, to the minute quartiarr, and of volume, to the almost atomic senisoll, must not fail to commence its series of practical measures of capacity, by vessels of which the content shall be of one cubic binilinn and one cubic primilinn. These are quite appreciable and measurable quantities. It is time to have done, in scientific parlance, with those inexact, uncertain expressions, so common in pharmacy, and in the practice of medicine, tea-spoonful, table-spoonful, and drops, unless indeed—which is much to be desired—the several sizes of spoons were modeled, by common consent of manufacturers, upon well-known systematic quantities. This idea would, probably, soon be realized, if a metrical system providing such quantities, were generally adopted by the nations.

It is one of the characteristics of the Linn-base Decimal System, recommending it particularly to the acceptance of scientific men, and to general adoption, that the several parts bear a far more direct and simple and scientific relation to the base, and to each other, than obtains in the "Metrical System" of France. Each unit being immediately derived from the base-linn itself, and not from a multiple, or from a fraction of it—the soll and capp and poudd being cubes of the linn, and the arr, its square,—there results, for the whole, a seemly and practically useful harmony, which is wanting in the metrical system. In the last-named system, the *are* is the square of a *décamètre;* the *litre* is the cube of a *décimètre;* the *gramme* is the cube of a *centimètre*, and the *stère* alone, comes immediately from the *mètre* itself, being its cube. From this variety springs a confusion, in reference to the *Mètre*, of the numerals employed to form the several denominations,—a confusion which is distracting to most minds, and which mars the beauty of the system, as a whole. The harmony referred to, and the parallelism of the several departments, and the absence of those qualities in the French system, are made apparent to the eye, as well as to the mind, by inspection of the Synoptical Com-

parative Table hereto annexed. In that Table is exhibited the relation of all the parts to the base-linn, and to each other; and then, the *mètre*, with the "Metrical System" beside it, being placed in juxtaposition, and in proper relation to the Linn, the relation of the several parts of the Metrical System to its base-mètre is seen, and the two systems compared.

This harmony has been spoken of as not only seemly, but practically useful. In proof, be it remarked, that it puts to every man's hand, and in the possession of every family, for domestic purposes, a ready, convenient, and perfectly simple substitute for any of the regular systematic weights or measures—a substitute, not of scientific exactness, but very nearly equivalent, sufficiently so, for all ordinary purposes. In a 1 capp measure of common water, we have the equivalent of a 1 pondd weight. In 3, 4, 15, 50, 100 capp of water, we have the equivalents of 3, 4, 15, 50, 100 pondd of weight. One binicapp of water is equivalent to 1 binipondd of weight. And so of all the systematic measures of capacity, ~~from the 1 binicapp to the triacapp from one third of an ounce to 2200 pounds.~~ *Any of the measures, filled with water, supplies the weight of its numerically corresponding pondd.* Indeed, it will be only necessary to know the contents in capp, of any vase, can, barrel, hogshead, or reservoir containing liquids, to tell instantly, with fair approach to accuracy, its actual weight in pondd, by the simple mental substitution of "pondd" for "capp." And *vice versâ*, if a capp or binicapp-measure be wanting, weigh in any other vessel, a pondd, or a binipondd of water, and you have the content desired.

It is urged against a decimal system of measures and weights, that it "has been found, in practice, unsuited to the purposes of retail traffic, to which, in fact, only a binary system, or the division of the unit into halves and quarters seems applicable." Now, it is asked, in all seriousness, if with any candor, or justice, or common sense, such objection can lie against the Linn-Base Decimal System here described? All of its units—measures and weights to be upon all counters, and daily used in "retail traffic," *are divided into hundredths.* Is it not just

as easy, we demand, and just as convenient to ask for, to give, and to receive *seventy-five primilinn* of calico, as "three quarters of a henalinn" of that fabric? Is it not just as easy and convenient to ask for, to give, and to receive *twenty-five binipondd* of sugar, as "a quarter of a pondd" of the article? or *fifty binicapp* of milk, as "half a capp?" Why, these terms, for all possible "purposes of retail traffic," practical and theoretical, are respectively equivalent.

These objectors to decimal systems for "retail traffic" forget, or are not aware of this mode, (by division of units into hundredths), of rendering decimal systems "binary."

DENOMINATIONS.

MEASURES OF GRAVITY—WEIGHTS—UNIT PONDD.

DENOMINATIONS.	VALUE PONDD.	ENGLISH AND AMERICAN EQUIVALENTS.	FRENCH.
Triapondd..	1000	2204.8571428 lbs. av.d.p.=0.984 ton.	Tonneau.
Duapondd..	100	1.9686 cwt.=220.48 lbs. avoirdupois.	Quintal Métrique.
PONDD	1	15434 troy grs.=2.679513888 troy lbs.	kilogramme.
Binipondd..	$\frac{1}{100}$	0.321541 troy oz.=0.352777 oz. av.d.p.	décagramme.
Quartipondd	$\frac{1}{10000}$	0.07717 scruple=1.5434 grains.	décigramme.
Senipondd..	$\frac{1}{1000000}$	0.015434 grains=1 cubic binilinn.	milligramme.

100	senipondd	(sP)	make	1	quartipondd
100	quartipondd	(qP)	"	1	binipondd
100	binipondd	(bP)	"	1	PONDD
100	PONDD	(P)	"	1	duapondd
10	duapondd	(dP)	"	1	triapondd (tP)

This system employs but four denominations of practical weights, as seen in the following category; yet it affords greater facilities, and is no less comprehensive, than the "Metrical System," which employs eight denominations, nor than the English and American systems, which, with their troy, avoirdupois, and apothecaries' weights, count thirteen denominations.

The Weights, to be used under this system, are as follows:

Number and Denominations of Weights used in the Linn-Base Decimal System.

NO.	DENOMINATIONS.	AMERICAN AND BRITISH EQUIVALENTS.	FRENCH.
one	of 75 pondd	200.9635 lbs. troy=165.364275 lbs. av.d.p. . .	7.5 myriagrammes.
one	" 50 "	133.97569 lbs. troy=110.24285 lbs. av.d.p. . . .	5 "
one	" 20 "	53.59 lbs. troy	2 "
two	" 10 "	22.048571 lbs. avoirdupois	1 "
one	" 5 "	11.024 lbs. av.d.p. = 13.4 lbs. troy	5 kilogrammes.
two	" 2 "	4.4 lbs. " = 5.359 lbs. "	2 "
two	" 1 "	2.2 lbs. " = 2.6795 lbs. "	1 "
one	" 75 binipondd	1.65 lbs. " = 2.0096 lbs. "	7.5 hectogrammes.
one	" 50 "	1.1 lbs. " = 1.33975 lbs. "	5 "
one	" 20 "	0.44 lbs. " = 0.5359 lbs. "	2 "
two	" 10 "	0.22 lbs. " = 0.26795 lbs. "	1 "
one	" 5 "	0.11 lbs. " = 1.6077 ounce troy	5 décagrammes.
two	" 2 "	308.68 grains = 0.643 ounce troy	2 "
two	" 1 "	2.57 drachms = 154.34 grains	1 "
one	" 75 quartipondd	115.755 grains = 1.929 drachms	7.5 Grammes.
one	" 50 "	77.17 " = 1.286 drachms	5 "
one	" 20 "	30.868 " = 1.5434 scruples	2 "
two	" 10 "	15.434 " = 0.7717 "	1 "
one	" 5 "	7.717 " = 0.38585 "	5 décigrammes.
two	" 2 "	3.0868 " = 0.15434 "	2 "
two	" 1 "	1.5434 " = 0.07717 "	1 "
one	" 75 senipondd	1.15755 " = ...	7.5 centigrammes.
one	" 50 "	0.7717 " = 0.03858 "	5 "
one	" 20 "	0.30868 " = ...	2 "
two	" 10 "	0.15434 " = 0.007717 "	1 "
one	" 5 "	0.07717 "	5 milligrammes.
two	" 2 "	0.0308 "	2 "
two	" 1 "	0.015434 "	1 "

All the above weights have their exact equivalents in the usual French system, except the 75s. But these last will be found convenient, and almost necessary for ready combination in the higher tens.

MONEY.

UNIT—MONN.

DENOMINATIONS.	VALUE.	AMERICAN.	BRITISH.	FRENCH.
	Monn.	$. c. m.	£ s. d.	Frs c.
Henamonn....	10	9.35.	2.0.4.5	50.00.
Monn.........	1	0.93.5	4.0.45	5.00.
Centt.........	$\frac{1}{100}$	0.9.35	0.4845	05.
Mill..........	$\frac{1}{1000}$	0.935	.04845	0.5

10 mill (m)	make	1	centt	(c)
100 centt	"	1	MONN	(M)
10 MONN	"	1	Henamonn	(hM)

COINS TO BE USED UNDER THIS SYSTEM.

DENOMINATIONS.	VALUE.			
Gold.	M. c. m.	$ c. m.	£ s. d.	Frs. c.
Double-Henamonn..	20.00.0	18.70.0	4.0.9.	100.00
Henamonn.........	10.	9.35.	2.4.5.	50.
Demi-Henamonn....	5.	4.67.5	1.0.2.25	25.
Silver.				
Monn..............	1.	93.5	.4.0.45	5.
50 centt...........	.50.	46.7.5	.2.0.225	2.50
25 centt...........	.25.	23.3.75	.1.0.1125	1.25
10 centt...........	.10.	9.3.50	4.845	.50
5 centt............	.05.	4.6.75	2.4225	.25
Copper.				
2 centt............	.02.	1.8.7	.969	.10
1 centt............	.01.	9.350	.4845	.05
5 mill.............	0.5	4.675	.24225	.02.5

In order to familiarize the people promptly as possible with the new system, and for their real convenience too, in that it would enable them, in emergencies, to establish and verify its weights and measures, the diameter and weight of coins—particularly of the silver and copper coins—should be stamped upon one of their faces; and a graduated line, divided into binilinn, drawn through the centre. By these means, in con-

nection with the use of the capp and binicapp, as above described—and when the reformation of spoons, as previously suggested, shall be effected—it would not be long after the adoption of the system, ere every family in Christendom, without any special effort to that end, and without a teacher, might become perfectly acquainted with the theory of the system, and able to extemporize for prompt daily use, in town and country, in hut and palace, in the workshop, in the kitchen, in the parlor, its three practical units, the linn, capp, and pondd, with their multiples and fractions. Indeed, a single centt, if stamped as recommended, could, in case of need, supply all of three units. Its diameter would establish the linn. Its weight would give the pondd. The pondd and a mug of water would establish the capp.

It will be observed that the Linn-Base system adopts the French money, without other change than that of name, and the substitution of the five-franc piece, instead of the franc, as the monetary unit. This is done, not because the sum of five francs is deemed positively the best, and most suitable value for a monetary unit; nor because it is believed to possess any advantage over the American dollar, entitling it to the post of honor. It has no such advantage. Indeed, the dollar is preferable, in that it is slightly superior in value; and possessing, equally with the French coin, the decimal character, it has, moreover, the incontestible and very important advantage of being already universally and favorably known in the world's commerce, as the monetary unit of one of the leading commercial powers. Its adoption, therefore, would subject commerce and peoples to comparatively little disturbance and difficulty. But the concurrence of France in the projected reformation is very desirable. The painful throes of recently-accomplished reform within her own limits, are but just subsiding; and she would very naturally recoil from their renewal soon, or at all. Her "Metrical System" is admirable and glorious. The world is daily according to her the praise due to its achievement. It constitutes the first great step in the path of much-needed reform; and will never be forgotten by an

admiring and grateful world. But the system is imperfect in its very design; and is incapable of being made suitable for adoption by the nations, as the one, common, satisfactory system. Its monetary department, if not positively the best that could be devised, is very good; and, with the changes proposed, might become acceptable in a general system of measures, weights, and money. It has, therefore, been adopted and incorporated into the Linn-Base System in the hope, if the Linn-Base System should find favor with the world, and be deemed suitable for general acceptance, as the common system, that France may be induced, by this concession in her favor, to join the family of nations in its adoption; and again to meet, for her own ultimate good, and the convenience of the world, the just quieted troubles incident to such change.

But if—other nations being disposed to accept the new system—France should positively refuse her concurrence, then, it would be advisable, in order to disturb the world's commerce, and the interior life of nations, as little as possible, to reject the five-franc piece, and assume the American dollar as the monetary unit. Or, let the nations, persevere in the efforts now being made to find some other more convenient and acceptable unit of money than the American dollar; and applying to it, when found, the names and other suggestions herein proposed, incorporate it into the Linn-Base System of measures and weights.

A word, in conclusion, touching the exact scientific length of the standard-base of this new system. It is now well known, and generally admitted, that the distance of *ten million mètres*, found by the trigonometrical measurement of 1806–7 as the distance from the equator to the pole, is a little too short. Bissel found it too short by 935 yards; Puissant, by 1411 yards; Chazallon, by 1958 yards. The great surveys in India (1832–42) also present slightly varying results. If any system of measures and weights, founded upon the measurement of an arc of the earth's meridian, be adopted by the nations, the error above signalized, whatever it be, should be ascertained as exactly as possible, and formally corrected. It is certain,

in advance, that the error would amount to nothing in its application to the measures and weights of commerce. The difference to be ascertained is so slight as to be quite inappreciable as affecting the length of the Linn. But for theoretic and scientific uses—astronomical and other—to say nothing of the honor of science—the length of the Octalinn should be determined with the utmost precision to which science can attain.

SYNOPSIS

OF THE LINN-BASE DECIMAL SYSTEM.

UNIT OF LINEAL MEASURE.

LINN.

(The 100,000,000*th* part of the quadrant of the earth's meridian.)

Measures.		*Units.*	*Value.*
Length	unit	Linn	= 3.93700910 inches of imperial yard.
Area	"	Arr	= 1 square linn = 15.5000406535 square inches.
Solids	"	Soll	= 1 cubic linn = 61.023801103 cubic inches.
Capacity	"	Capp	= 1 cubic linn = 1.7606 pints imp. gallon.
Weight	"	Pondd	= 1 cubic linn = 2.6795 troy pounds.
Money	"	Monn	= 5 francs.

LENGTH.	AREA.	SOLIDS.	CAPACITY.	WEIGHT.	MONEY.
	Decarr				Decamonn
Octalinn	Octarr	Octasoll			
	Hexarr	Hexasoll			Hexamonn
Pentalinn					
Tetralinn	Tetrarr	Tetrasoll			
			Triacapp	Triapondd	
Dualinn	Duarr	Duasoll	Duacapp	Duapondd	
Henalinn					Henamonn
LINN	ARR	SOLL	CAPP	PONDD	MONN
Primilinn					
Binilinn	Biniarr	Binisoll	Binicapp	Binipondd	Binimonn
	Quartiarr	Quartisoll	Quarticapp	Quartipondd	Quartimonn
		Senisoll	Senicapp	Senipondd	

It would perhaps be well to suppress the *ternicapp*, and add the quarticapp ; making the

SYNOPTICA

LOGARITHMS.		GEOMETRICAL PROGRESSION.	THE LINN-BASE DECIMAL SY				
Numerals of the System.		*Value of the Units.*					
etc.		*etc.*	*etc.*	*etc.*	*etc.*	*etc.*	
	22	10^{22}	$Linn^{22}$	Arr^{22}	$Soll^{22}$	$Capp^{22}$	
	21	10^{21}					
	20	10^{20}	L^{20}	A^{20}	S^{20}	C^{20}	
	19	10^{19}					
	18	10^{18}					
	17	10^{17}					
	16	10^{16}	$Linn^{16}$	Arr^{16}	$Soll^{16}$	$Capp^{16}$	
	15	10^{15}					
	14	10^{14}					
	13	10^{13}					
	12	1000000000000					
	11	100000000000					
deca	10	10000000000		decarr			
enna	9	1000000000					
octa	8	100000000	octalinn	octarr	octasoll		
hepta	7	10000000					
hexa	6	1000000		hexarr	hexasoll		
penta	5	100000	pentalinn				
tetra	4	10000	tetralinn	tetrarr	tetrasoll		
tria	3	1000				triacapp	t
dua	2	100	dualinn	duarr	duasoll	duacapp	d
hena	1	10	henalinn				
unit	0	1 unit	LINN	ARR	SOLL	CAPP	l
primi		$\frac{1}{10}$	primilinn				
bini		$\frac{1}{100}$	binilinn	biniarr	binisoll	binicapp	b
terni		$\frac{1}{1000}$					
quarti		$\frac{1}{10000}$		quartiarr	quartisoll	quarticapp	q
quini		$\frac{1}{100000}$					
seni		$\frac{1}{1000000}$			senisoll	senicapp	s

COMPARATIVE TABLE

		THE FRENCH “METRICAL				
	etc.					
12						
	Monn^{14}					
	M^{12}					
	Decamonn					
	Hexamonn					
		10000	miriamètre			
		1000	kilomètre	hectare		
ld		100	hectomètre			kilolitre
ld		10	décamètre	ARE	décastère	hectolitr
3	Henamonn	1 mètre	MÈTRE		STÈRE	décalitre
	MONN	$\frac{1}{10}$	décimètre	centiare	décistère	LITRE
		$\frac{1}{100}$	centimètre			décilitre
ld	binimonn	$\frac{1}{1000}$	millimètre			centilitre
						millilitre
ndd	quartimonn					
dd						

LOGAR[illegible] SYSTEM.”

Nume[illegible] of the S[illegible] etc.		*French Numerals.*
22		
21		
20		
19		
18		
17		
16		
15		
14		
13		
12		
11		
deca		déca-myria-myria
enna		myria-myria
octa		kilo-myria
hepta		hecto-myria
hexa		déca-myria
penta	tonneau	myria
tetra	quintal métrique	kilo
tria	myriagramme	hecto
dua	kilogramme	déca
hena	hectogramme	unit
unit	décagramme	déci
primi	GRAMME	centi
bini	décigramme	milli
terni	centigramme	déci-milli
quarti	milligramme	centi-milli
quini		milli-milli
seni		déci-milli-milli
		centi-milli-milli
		milli-milli-milli.